

REMARKS

Claims 1 to 21 are pending in this application. Claims 1-20 are rejected. Claims 1-4, 9, 12-14, 16, 19 and 20 are amended herein. Claim 21 is newly added herein.

The Rejection Under 35 U.S.C. §112

Claim 16 is amended herein to overcome the basis for the rejection under 35 U.S.C. §112, second paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

The Rejections Based Upon Prior Art

1. Claims 1, 2, 8, 12 and 15 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,652,201 (hereinafter, "Papay et al."). Papay et al. is directed to lubricating oil compositions and concentrates and discloses the use of overbased calcium sulfonates as detergent additives for lubricant oils.

Independent Claims 1 and 12 are amended herein to recite, *inter alia*, an amorphous overbased alkaline earth metal sulfonate in an amount sufficient to provide a sedimentation rate of no more than about 0.005% per week at 70°C for at least 12 weeks. Support for this recitation can be found in Applicant's specification at page 10, lines 7-10, and in Examples 13-16 (Table 2) and 23-28 (Table 3).

Applicant has found that use of amorphous overbased calcium sulfonate as a component in an additive mixture for lubricant oils, in conjunction with friction modifiers set forth in claim 1, provides superior results in formulating a lubricant composition having exceptionally low

sedimentation rates. Typically, as demonstrated by Applicant's examples (see, e.g., Table 3 in the specification), the sedimentation resulting from the use of the amorphous overbased calcium sulfonate was no more than about 2% of the sedimentation resulting from the use of crystalline calcium sulfonate.

Papay et al. does not disclose or suggest such an advantage to the use of amorphous alkaline earth metal sulfonate and the degree to which sedimentation is thereby reduced. Accordingly, Papay et al. does not render the aforementioned claims anticipated or obvious. Reconsideration and withdrawal of the rejection are respectfully requested.

2. Claims 1, 2, 6, and 12 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,954,273 (hereinafter, "Denis et al."). Denis et al. is directed to oil formulations containing overbased multi-functional additives and is cited for disclosing the use of overbased calcium sulfonate and overbased calcium carboxylate as components of an additive composition.

Claims 1 and 12 are amended as indicated above. Denis et al. does not disclose or suggest the use of amorphous overbased alkaline earth metal (e.g., calcium) sulfonate, nor does Denis et al. teach anything about sedimentation rates and the improvement thereof achieved by the use of amorphous calcium sulfonate. Accordingly, this rejection no longer obtains. Reconsideration and withdrawal of the rejection are respectfully requested.

3. Claims 1, 2, 5, and 12 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5, 885,943 (hereinafter, "Watts et al."). Watts et al. is directed to sulfur boron

antiwear agents for lubricating compositions and is cited for disclosing overbased calcium sulfonate as a detergent and an additive package including polyisobutylene succinic anhydride (PIBSA).

Claims 1 and 12 are amended as indicated above. Watts et al. does not disclose or suggest the use of amorphous overbased calcium sulfonate, nor does Watts et al. teach anything about sedimentation rates and the improvement thereof achieved by the use of amorphous alkaline earth metal sulfonate. Accordingly, this rejection no longer obtains. Reconsideration and withdrawal of the rejection are respectfully requested.

4. Claims 3-4 and 13-14 are rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of U.S. Patent No. 4,995,993 ("Papke et al."). Papke et al. is directed to a process for preparing overbased metal sulfonates and is cited for disclosing a preferred amorphous overbased calcium sulfonate with a particle size of 100 to 150Å (10-15 nm) and a crystalline overbased calcium sulfonate with a particle size of 400 to 600Å (40-60 nm).

Claims 3-4 and 13-14 depend respectively from independent claims 1 and 12. Claims 1 and 12 are amended herein to recite an amorphous overbased alkaline earth metal sulfonate in an amount sufficient to provide a sedimentation rate of no more than about 0.005% per week at 70°C for at least 12 weeks. Papke et al. does not recognize the sedimentation reducing advantages provided by the use of amorphous overbased alkaline earth metal sulfonate, nor does Papke et al. disclose or suggest the use of amorphous overbased calcium sulfonates in an amount sufficient to reduce sedimentation rates to no more than about 0.005% per week at 70°C for at

least 12 weeks, as exhibited by the present invention and generally recited in claims 1 and 12.

Accordingly even if the teachings of Papke et al. and Papay et al. were to be combined, Claims 1 and 12, and all claims depending therefrom would not be rendered obvious. Reconsideration and withdrawal of the rejection are respectfully requested.

5. Claim 7 is rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of U.S. Publication No. 2004/0063589 ("Ramey et al."). Ramey et al is directed to lubricant compositions containing an overbased amorphous alkaline earth metal salt as a metal protectant, and is cited for disclosing an overbased barium carboxylate as a friction modifier.

Claim 7 depends from claim 1, which has been amended to recite an amorphous overbased calcium sulfonate, as discussed above. Ramey et al. does not disclose or suggest the use of an amorphous overbased calcium sulfonate as a component in an additive for lubricant oils, much less in an amount sufficient to reduce sedimentation rates to no more than about 0.005% per week at 70°C for at least 12 weeks.

Accordingly, even if Ramey et al. were to be combined with Papay et al. Claim 7 would not be rendered obvious. Reconsideration and withdrawal of the rejection are respectfully requested.

6. Claim 19 is rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of U.S. Patent No. 3,754,684 ("Chladek"). Chladek is directed to a central lubricating dispenser, and is cited for disclosing a storage vessel for lubricants.

Independent claim 19 is directed to a method for storing a lubricant composition, and includes the step of combining with a lubricant stock an additive mixture. The additive mixture includes, as a component, an amorphous overbased alkaline earth metal sulfonate in an amount sufficient to provide a sedimentation rate of no more than about 0.005% per week at 70°C for at least 12 weeks. As explained above, Papay et al. does not disclose or suggest such a feature. Chladek merely discloses the storage of lubricant oil in a vessel. Even if these two references were to be combined, claim 19 would not be rendered obvious.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

7. Claims 9 and 16 are rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of U.S. Publication No. 2004/0180798 ("Hartley et al."). Hartley et al. is directed to friction modifiers for engine oil compositions, and is cited for disclosing a friction modifier formed by the reaction of triethanolamine and a fatty acid such as oleic, erucic and tall oil fatty acids.

Claim 9 is placed in independent form and discussed more fully below and Claim 16 depends from independent claim 12 which has been amended to recite an amorphous overbased alkaline earth metal sulfonate, as discussed above. Hartley et al. does not disclose or suggest the use of an amorphous overbased alkaline earth metal sulfonate as a component in an additive for lubricant oils, much less in an amount sufficient to reduce sedimentation rates to no more than about 0.005% per week at 70°C for at least 12 weeks.

Accordingly, even if Hartley et al. were to be combined with Papay et al. claims 9 and 16 would not be rendered obvious. Reconsideration and withdrawal of the rejection are respectfully requested.

8. Claim 20 is rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of Chladek, as applied to claim 19, and further in view of Hartley et al.

Claim 20 depends from independent claim 19, which is submitted to be allowable for the reasons stated above. The combination of these references provides no basis for the rejection of claim 20 as being obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

9. Claims 10, 11, 17 and 18 are rejected under 35 U.S.C. §103(a) as being obvious over Papay et al. in view of U.S. Patent No. 3,198,737 ("Calhoun"). Calhoun is directed to lubricating compositions and additives, and is cited for disclosing a friction modifier comprising a diethylene glycol dioleate, a reaction product of diethylene glycol and methyl oleate, as recited in claims 11 and 18; and a friction modifier comprising a thiodiglycol (2,2'-thioethanol) dioleate, a reaction product of thiodiglycol with methyl oleate, as recited in claims 10 and 17.

These claims depend from independent claims 1 and 12, which are submitted to be allowable for the reasons stated above. Neither Calhoun nor Papay et al., individually or in combination, teaches the use of an amorphous overbased alkaline earth metal sulfonate as a

component in an additive for lubricant oils, much less in an amount sufficient to reduce sedimentation rates to no more than about 0.005% per week at 70°C for at least 12 weeks.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Other Amendments

Claim 9 is placed into independent format by amendment herein and some of the members of the Markush group have been deleted. New claim 21 is added and depends from claim 9.

Referring to page 20 of the specification and Table 7 at page 21, it can be seen that the use of a friction modifier comprising the reaction product of TEA and certain fatty compounds unexpectedly provides lower sedimentation than other friction modifiers, even in conjunction with the use of crystalline overbased calcium sulfonate. Surprisingly, there is also shown to be a significant difference among the type of fatty compounds. The reaction product of TEA and methyl oleate, tall oil fatty acid, oleic acid iso-stearic acied and mixed oleic/stearic acids provided significantly lower sediment after 12 weeks than the baseline of 0.25% (without friction modifier). Even more significantly, friction modifiers comprising the reaction products of TEA and methyl oleate, tall oil fatty acid, or oleic acid (see Claim 21) demonstrated sedimentation rates of 0.05%, 0.06% and 0.05%, respectively, after 12 weeks. These sedimentation results are surprisingly far less than even those of the reaction products of TEA and isostearic acid (0.15%) and mixed oleic/stearic acids (0.20%). These results demonstrate the unobviousness of the invention as covered by Claims 9 and 21.

CONCLUSION

For at least the reasons stated above all of the pending claims are submitted to be in condition for allowance, the same being respectfully requested.

Respectfully submitted



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